CUG

Newsletter

April 1994

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- ***Latest News on Commodore***
- ***Retina 24-bit Card Reviewed***
- ***Amiga TCP/IP Explained***
- ***How to Beat Computers at Chess***
- ***GoldEd Programmer's Editor***

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Newsletter
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Commodore Users
Group of Ireland

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The deadline for articles for the July Newsletter is July 22, 1994.

Editorial

Welcome to what is probably the latest issue ever. One reason for the delay is that I recently moved back to Ireland from the US, and it's taken be some time to get back settled in again.

Another reason is that Commodore's recent bankruptcy has been causing intense speculation as to what the future holds for Amiga users, and I was anxious to get as much information as possible on the situation. You can read the latest news on the opposite page.

Needless to say, CUGI will continue to support the Amiga well into the future; if anything, events like this tend to draw Amiga users closer together.

In spite of all this, we have a meat-filled issue. If you've been wondering how to get directly connected to the Internet, then Karl has the answer for you with a look at AmiTCP. We also have reviews of the Retina graphics board, the programmer's editor *GoldEd*, and a look at the current state of computer chess programs. Thanks to all who contributed, and raspberries to all who didn't :-)

So, how did I get on in the chilly climate of Minnesota, USA, I hear you ask? Well, I was pleased to get the chance to return to the local Minnesota User's Group (AMIGA) which I first encountered just before Christmas. Unlike CUGI, where we hold meetings every fortnight, AMIGA have a general meeting once a month, along with special interest groups of 5–15 people who meet at different times during the month.

One of the more interesting things they're currently involved in is a monthly cable television show which covers the Amiga in general. It's produced using the Video Toaster (3.0) and is quite a good showcase for the club.

I picked up quite a lot of hardware on this trip. As well as the usual bits and pieces (e.g. two external SCSI cases), the main items of interest I brought back were a 1.8 Gb 3.5″ hard drive for Infomatique, a 2 Gb SCSI DAT tape drive for backups, and a 24-bit Epson 300C flatbed scanner. The total for all three items was under $2000, which I was rather pleased with—if you are looking for bargains, the opposite side of the Atlantic is definitely the place to go.

You may notice that something seems different in this month's issue—we've switched to a new font. Previous issues used Don Knuth's Computer Modern which is quite elegant but a little skinny, causing thin letter stems to vanish when photocopied. The new font is simply the standard PostScript Times font, which is quite a bit heavier. In addition, the headings and titles are now in a sans-serif font, which should make them a little easier to read.

Please let me know if you find the new look an improvement. Until next time. . .

E.C.

Commodore Update

by Eddy Carroll

There can't be many people who haven't heard the news that Commodore International filed for bankruptcy at the end of April. It's been the main item of discussion in all the major online Amiga networks, and the story has been covered in the mainstream press as well as the usual Amiga magazines.

As you might expect, there has been a lot of wild speculation, much of it way off beam. While I don't claim to have all the answers, I hope I can at least discredit some of the more bizarre rumours.

At press time, the situation is as follows. Commodore has filed for bankruptcy in the Bahamas (where its corporate headquarters are, for tax reasons). Under Bahamian law, Commodore were obliged to make a public statement of intent by the end of May; however, it seems they have managed to get this deadline extended by two weeks.

The usual reason for such an extension is to grant companies some additional time to close ongoing negotations with interested buyers. Such extensions aren't granted lightly, which means that Commodore must have been able to persuade the Bahamian courts that they were close to completing a deal.

Ready to Sell

Just about every electronics company on the planet has been mentioned as a potential purchaser of the Amiga technology, from Amstrad to Sony. There have also been rumours of a third-party Amiga developer buyout (headed by Jim Drew of Emplant fame) and of a GVP/Newtek consortium.

A board of trustees has been nominated which will oversee the selling off of the company, either as a single unit or as several separate parts. One of the goals of the trustees is to ensure that the final buyer is committed to continuing to develop the Amiga technology; hopefully, this will prevent it being bought up by a competitor to simply remove it from the marketplace.

There would appear to be four or five serious contenders (serious, in that they have actually made a bid for Commodore). The leading contender is the Korean electronics giant Samsung, which has been involved in discussions with Commodore for the past month or so and has been visiting Commodore's various facilities. A report from an 'insider' on Internet said that while Samsung is currently the forerunner in terms of their plans for the Amiga, Commodore's trustees are unhappy with the amount of their bid, which is one of the lowest.

Other potential buyers include Hewlett Packard and Phillips. HP is already partnering with Samsung in some other areas, and in addition, has been evaluating the CD^{32}/AGA technology for use in its range of intelligent TV settop boxes. Phillips would almost certainly like to get its hands on the CD^{32} to remove it from the market, since it has been far outselling Phillips' competing CD-i system. Regardless, we should know one way or another within a week or two.

What the Future Holds

Let's speculate a little and suppose that Samsung are successful in their bid for Commodore. This would give Samsung the rights to the Amiga technology, including the latest AAA development systems sitting on engineers desks.

This could turn out to be a fantastic rebirth for the Amiga. Samsung is a company with a good reputation in the consumer electronics field, and which can afford to agressively advertise products (an idea that seemed foreign to Commodore). It also has extensive semiconductor facilities, which would allow it to continue manufacturing Amigas at competitive prices.

Imagine tie-ins with other Samsung products like video recorders. Imagine being able to plug your Amiga directly into your VCR and completely control it, allowing the Amiga to be used for video editing out of the box, as well as more simple tasks like programming your video using the mouse. All these things are easily possible.

The real focus, however, would ideally be on the higher-end Amiga systems. The Amiga 4000 range has a lot going for it, but also falls down in many places. With a suitable R&D budget, many of these faults could be easily rectified, and relatively quickly. Better graphics, expansion above 18 Mb, full speed high-density floppies, onboard SCSI, faster CPUs—these are all relatively easy to provide, and would greatly increase the Amigas utility for general purpose applications, while retaining its unique video capabilities.

Who's Left?

At present, only a skeleton crew remains at West Chester. Engineer Eric Cotton has reported that there are still around 20 Amiga engineers employed there. Perhaps the most well known, Dave Haynie, left this week to take a job at Scala (who by this stage are employing more Commodore engineers than Commodore themselves!), which has worried quite a few people on the networks.

However, many other good engineers remain and will presumably be more than happy to continue working under Commodore's new owners (assuming they retain an R&D facility in West Chester).

So, what does the future hold? In the worst case scenario where nobody buys up the Amiga technology, the Amiga will still be well supported by third-party developers for at least the next 18 months. And in the case of a successful takeover, we could be witness to the beginning of an Amiga golden age.

Leon's Lore

by Leon Hurst

It's been a while since I have written for the Newsletter. Now that I am off the committee I no longer feel guilty for not writing. However since the new year a few items of interest have come my way.

Firstly, "Thank the Lord for the Internet[1]". It was there that I found a good solution to the vertical banding problem on AGA machines. This problem exhibits itself as faint vertical bands running across the display in all screen modes (particularly in DBLPAL). The cause of this has been deemed by consensus on the Internet to be either a chip fault, or more likely a video clock signal running too near to the RGB lines on the motherboard.

So what is the solution, I hear you ask. Simply solder a 100 Ω resistor between pin 15 and ground in the 23–15 way VGA adapter, as shown in the diagram. Problem solved! It worked flawlessly for me [*And me—Ed*]. If you are not too handy with a soldering iron and want this procedure done to your adapter, get in touch with me or the committee and we can arrange something.

Note: be *very* careful not to make contact with pin 13, or you will almost certainly end up with a blown video port.

The Amiga Enters the Laboratory

Staying with Internet, a new monthly (paper) publication came to my attention, edited and published by a guy called Walt Lounsbery. He calls it *Scientific Amigan*. As the title suggests, it is devoted to scientific computing on the Amiga. This includes physics, chemistry, that most noble of pursuits Computer Science, and many more. Walt was good enough to send me a sample copy which turned out to be the Jan/Feb '94 issue. Some of the articles in that issue covered Internet, NetCDF scientific file format, MoG molecule editor and FORTRAN, along with columns and editorial.

The publication is 24 pages of A4 in about 10pt or 11pt font. There is quite an amount of text in it. Presentation is very good—it's produced using *PageStream* and has a clean look with a distinct style. There are a couple of ads for relevant products like AmigaTeX and *FastTrig* (a maths library replacement). Hopefully Walt will go on to review these products.

The only niggles I had were the excessive use of "continued on page..." which Walt has assured me don't appear in the second issue. Also, Walt himself has written a large proportion of the articles. As we know here at CUGI, a good

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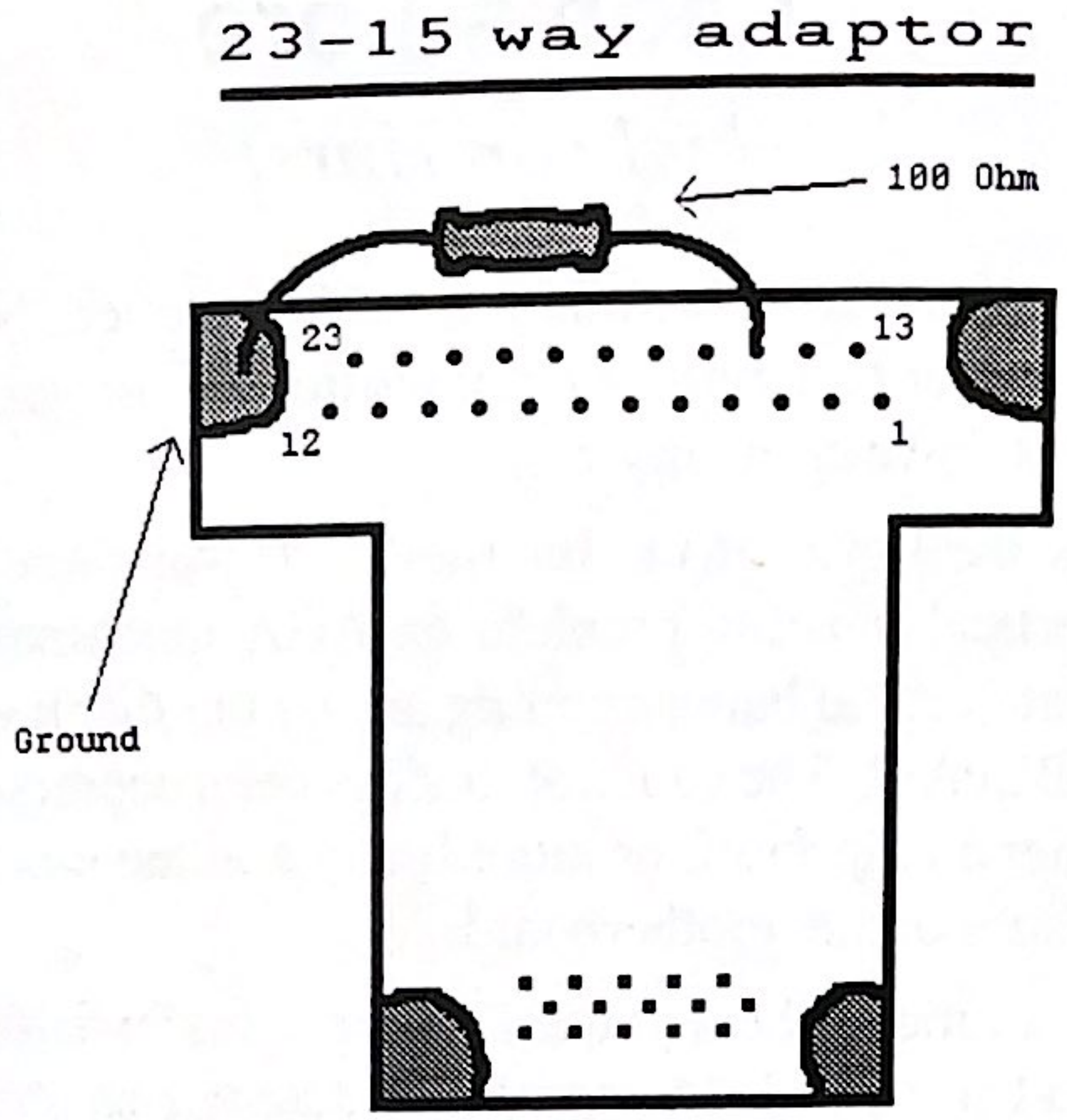
[1] See Colin's article in the January '94 Newsletter.



How to remove those pesky vertical AGA bars for once and for all.

variety of authors is essential. Imagine a newsletter where Eddy writes everything! Yikes no! `:-)` [*God forbid!—Ed*]

So if there are any scientists out there that use the Amiga for science and want to write about it, Walt is looking for more authors. He can be contacted at `waltal@well.sf.ca.us`. Good luck with the newsletter, Walt.

Taking Over the World

Now on to less technical matters—specifically, a game called *The Settlers*, which was demoed at CUGI a couple of months ago by Rocco. A month ago, while feeling really pissed off with college, life and the universe, I bought *The Settlers*. If you are a violent control freak like me, you will love this game. The best way to describe it is as a glorified cross between *Populus* and *SimCity*. The ultimate goal is to annihilate all completing settlements. But of course, it isn't that simple.

You begin with a castle in the middle of a small settlement. From there the objective is to expand your land holding and build up an interdependent economy that will eventually produce weapons and gold for your knights. When the above is accomplished and the knights are well trained, you can get down to some good ol' violence.

Some people like to start by taking out the surrounding knight towers of a settlement. I prefer a more direct approach, and send in about 30 of my most highly trained knights to attack an opponent's main castle (evil grin). When the castle falls to my knights the settlement can kiss its future goodbye.

The graphics are slick and gameplay is great. For me it is an absolutely brilliant idea brought to life with great style. It was about £35 in Virgin when I bought it.

The First Cuckoo of Spring?

The last thing of interest is a novel, something which isn't reviewed too often in the newsletter. Its title is *The Cuckoo's Egg.* The story begins with astronomer Clifford Stoll finding an accounting discrepancy of 75¢ on a computer network where he has just started working as system manager. The year is 1983 and this small error starts Cliff on the trail of a hacker who has his own specific agenda.

Although Cliff rarely leaves Berkeley in California, the story brings us all over the world. How, you may ask? Internet again, and even more importantly, MILnet (as in military) where Cliff finally... but you'll just have to read the book to find out what happens.

The book is based on the real life story of Cliff's hunt for a mysterious hacker. It is an engaging story which also portrays life in California during the early eighties, as well as containing lots of history on the Internet. The real life Clifford has written a gripping book generously dotted with his own style of humour that is almost impossible to put down. All technical jargon and ideas are carefully explained for the computer illiterate. It's a pity Clifford doesn't write Commodore's manuals! This book comes highly recommended at about £6 from Hodges Figgis or Waterstones.

GoldEd

by Colin Dalton

Recently, our Technical/Purchases Officer, Matt Brookes, organised a group registration of *GoldEd*, the programmer's text editor. Even though the program isn't quite finished yet (it is still, strictly speaking, a beta version), it impressed me with its long list of features. That, coupled with the excellent registration fee (a mere £7), made me decide to take the plunge and register it.

The program comes on two disks, and installs to your hard drive with a minimum of fuss using Commodore's Installer. The whole operation is designed to be as user-friendly as possible. You chose your preferred screen mode and programming language at installation time, so that when you run GoldEd for the first time, it is ready to go.

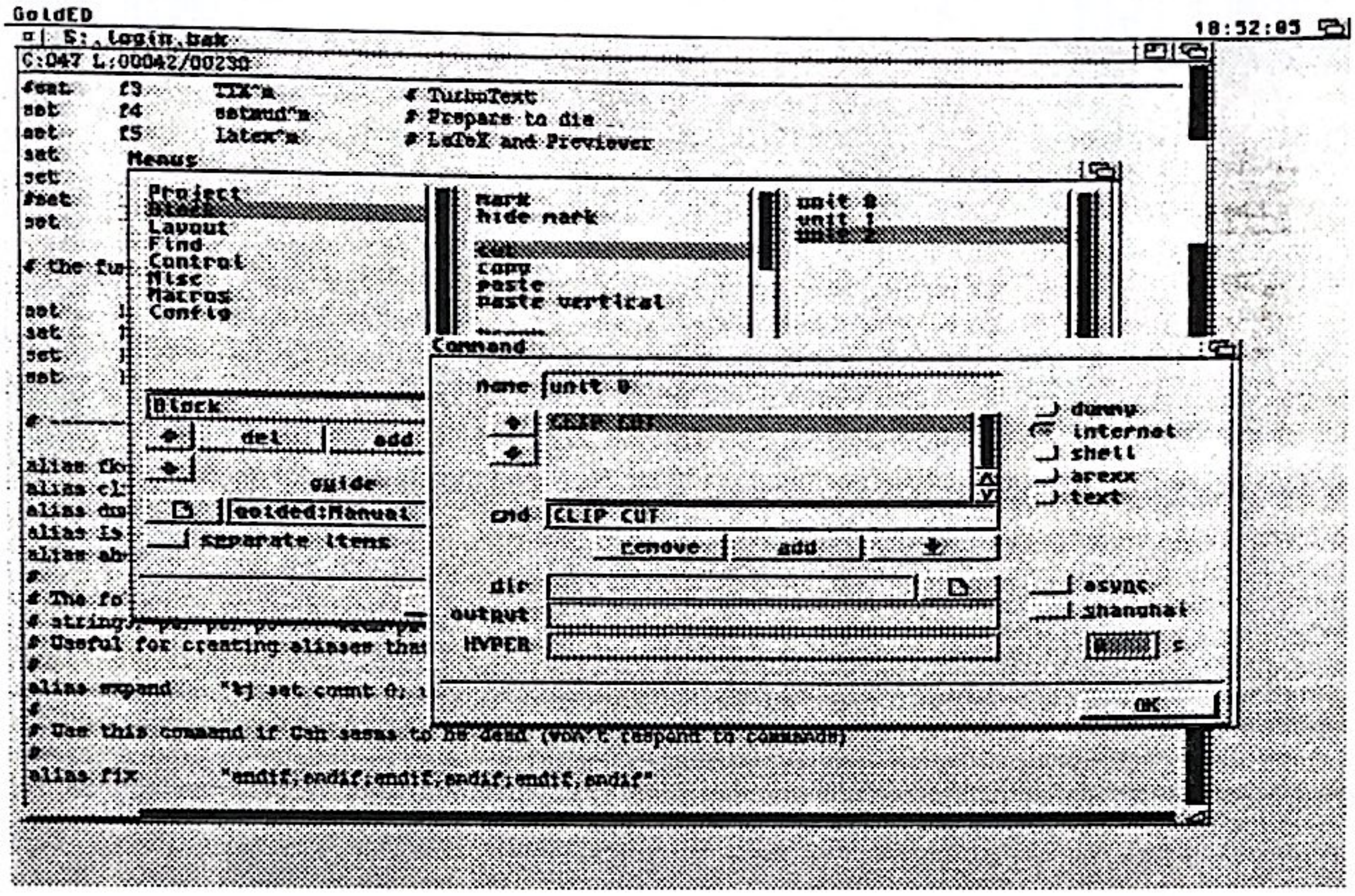
With such a powerful and configurable application, you might think it's easy to get lost; however, GoldEd has an excellent on-line help system. Pressing the Help key while selecting a menu item pops up AmigaGuide help with the correct page open—a very handy feature.

GoldEd is touted as a programmer's editor for a number of reasons. Firstly, the ARexx port makes it easy to add a menu item that runs a script on the currently active window (all menus are user-definable with GoldEd). Even though I am not much of a programmer, I found it trivial to add a LaTeX menu option that ran LaTeX and the previewer on my current document. Because of the Shanghai feature of Workbench 2.0 and above, it is even possible to get the LaTeX previewer to open on GoldEd's screen. GoldEd also comes with a GUI-based project manager for DICE C called *GUIMake*.

Navigating through large source files can be a pain, but GoldEd makes it easy in a number of ways. The first of these is folding. This is where sections of text (defined by beginning and end markers) can be collapsed into a single line. If you do this to all the functions or sections of your program, it is quite possible to fit the whole thing onto one screen, only unfolding those sections that you are editing.

The next handy feature is that at the touch of a button, a window pops up listing all the functions in your program—there is support for C, BASIC, Pascal and Assembly functions. If you click on a name from this list, the cursor is moved to the first line of the function. Of course, GoldEd has all the standard programmer's features, such as find matching bracket, automatic indentation (user-definable, with presets for ARexx, BASIC, C, E and Pascal), and all the others.

If you have ever tried programming the Amiga, you will know how important it is to know structure definitions and function arguments for the system libraries. How many times have you been sent scurrying for the RKMs, wondering whether



GoldEd can be easily configured to suit your needs.

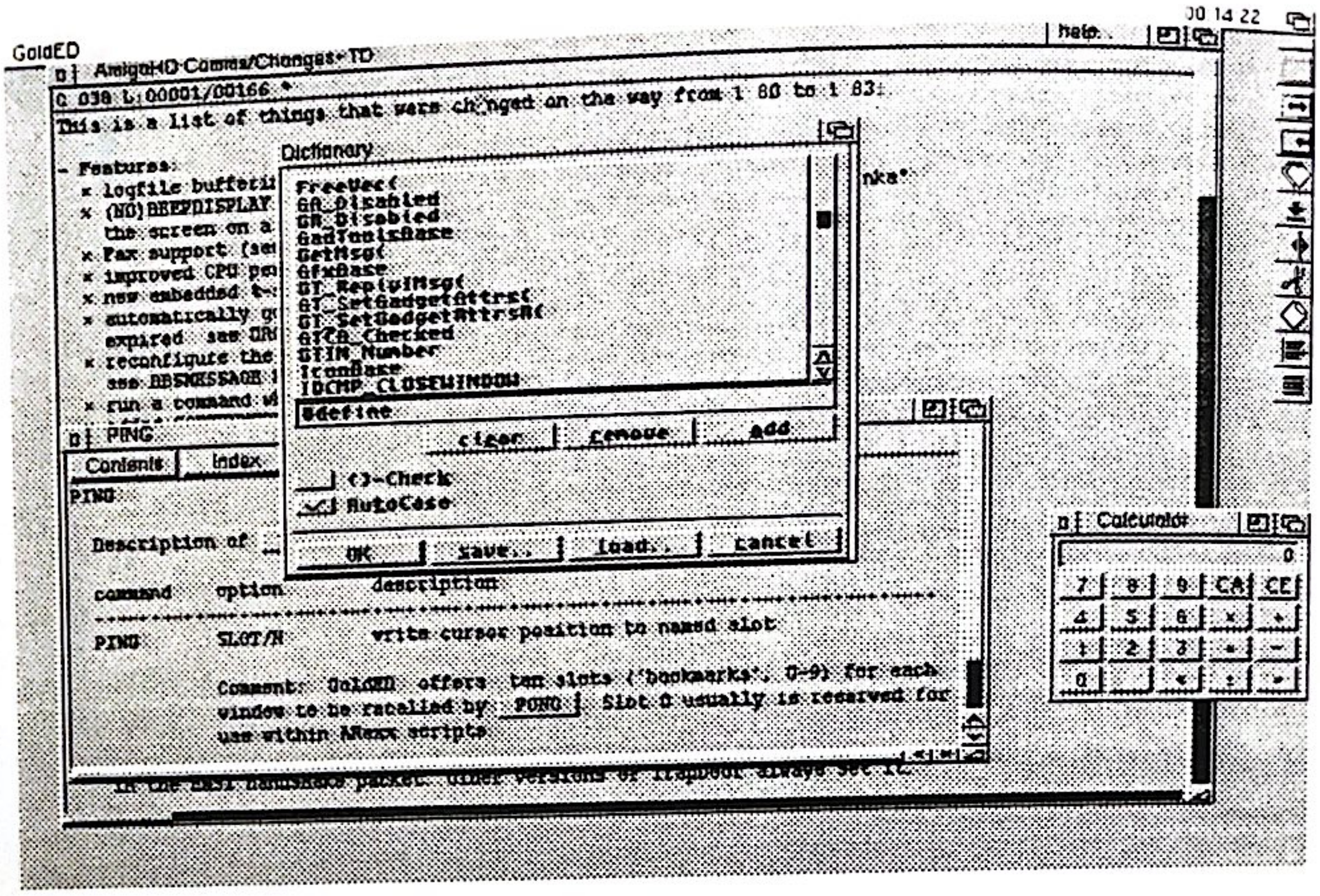
this function takes a char or int? Well, GoldEd has the answer to this frenetic searching in the form of referencing. You tell it where your Includes and AutoDocs are, and it will build a reference table. This means that the next time you are stuck, you just place the cursor on the function name and hit Reference. GoldEd then pops up a window with the function declaration, so you can see what arguments are required.

Another time-saving feature provided is keyword completion. Programming the Amiga, you come across many system functions with long names such as *GT_SetGadgetAttrsA()* and flags called IDCMP_REFRESHWINDOW. Now, while such names are an aid to memory, it can become quite tiresome having to type them out more than once.

To save wear and tear on your fingers, GoldEd has a dictionary of frequently used keywords. All you have to do is type a reasonably unique substring of the word, and hit the Complete key—GoldEd does the rest. For example, given the example above, I can just type ID_REF, and press Complete, and GoldEd expands it to its full version. As with everything in GoldEd, the dictionary used for completion is fully user-definable.

GoldEd even has a documented API (Application Programmer Interface), so that others can add features to GoldEd. One of the utilities to utilise this feature is a dock program. You can have a Toolmanager-like dock open on your GoldEd screen, and clicking on each of the icons sends a command to GoldEd's ARexx port or executes a command.

To go into all of GoldEd's features in the detail they deserve would take a long



```
This is a list of things that were changed on the way from 1.80 to 1.83:
```

```
FreeVec(
GA_Disabled
GA_Disabled
GadToolsBase
GetMsg(
GfxBase
GT_ReplyIMsg(
GT_SetGadgetAttrs(
GT_SetGadgetAttrsA(
GTCB_Checked
GTIN_Number
IconBase
IDCMP_CLOSEWINDOW
#define
```

☐ ()-Check
☑ AutoCase

```
PING

command    option      description
---------------------------------------------------------------
PING       SLOT/N      write cursor position to named slot

                       Comment: GoldED offers ten slots ('bookmarks', 0-9) for each
                       window to be recalled by PONG. Slot 0 usually is reserved for
                       use within ARexx scripts.
```

Online help, keyword dictionaries, toolbars—GoldEd has it all.

time, so I am going to take the easy way out, and tell you to download the demo from CUGI BBS, or copy it at a meeting—you might be pleasantly surprised!

Every Silver Lining...

Well, nothing is perfect, and it's fair to say that GoldEd isn't without its shortcomings. My main gripe is the fact that it is not possible to mark individual letters or words for cutting and pasting—it's either the whole line or nothing at all. This is apparently being worked on. I also don't like the way Undo is implemented—you can only undo changes made to the line as a whole, and once the cursor moves off the line, you can't undo it. Finally, I don't like the way it converts TABs to spaces.

Other than that, if there is anything that you don't like about the program, you can change it: every key and menu item (the default ones aren't capitalised) can be customised to do what you want. The excellent, well cross-referenced online help and copious examples make this easy.

As if that lot weren't enough, you also get an excellent DeskJet printing program, the project manager mentioned above, a program that tries to recover files in memory after a crash, and a host of other little utilities and programming examples.

Some die-hards will never stop using arcane editors such as vi and EMACS [*Because they're so good, of course!—Ed*] but if you're on the lookout for an editor that is cheap, easy to use, full of features, and very configurable, look no further than GoldEd.

Getting Connected with AmiTCP

by Karl Jeacle

In 1993, a group of students from the Helsinki University of Technology caused great excitement in the Amiga Internet community by announcing a free implementation of TCP/IP for the Amiga which they had built as part of a software engineering course. Until then, the only available Amiga implementation of the Internet protocol suite was Commodore's somewhat incomplete AS225 software.

The Confused Internet Protocol Suite

TCP/IP is the name commonly given to the Internet suite of communication protocols—simply, the software that lets all the machines connected to the Internet talk to each other. The name TCP/IP is something of a misnomer as IP (Internet Protocol) is the basic building block of Internet communications. Built above IP are two protocols: TCP (Transmission Control Protocol), a connection-oriented protocol, and UDP (User Datagram Protocol), a connectionless protocol. As TCP is the most commonly used protocol, people tend to refer to the whole collection as TCP/IP.

The simplest explanation of TCP and UDP is based on the analogy between the telephone and postal systems. Using TCP is like using the telephone, while UDP is similar to posting a letter.

When you open a connection to another machine using TCP, it's like dialing someone's telephone number. You have a permanent connection to the other party for the duration of your call. The connection is reliable and all the data gets through in the correct order—it's connection oriented.

Using UDP, on the other hand, is like sending someone a letter. You write the destination on the cover and somehow, the letter finds its way through. It may get lost, it may arrive out of order relative to other letters you have sent to the same address, or it might even get damaged. Each letter you send may take a different route to the same destination. It is connectionless.

Internet Applications

So, all this is great. But what use is AmiTCP? What does it do? Essentially, it's the software that will connect your Amiga directly to the Internet. This is, of course, assuming that you can get an IP feed to your Amiga, which is admittedly an unfortunately large assumption.

But let's say you have IP connectivity. What applications can you run? Well, thanks to the AmiTCP authors and many other Amiga Internet programmers, all of the classic Internet applications are available on the Amiga. Some of the more popular are:

Telnet The Internet's remote login program. Using telnet lets you use a machine remotely. It's as though you're sitting typing on the keyboard of the remote machine. AmiTCP can be set up to allow someone on the other side of the world to telnet to your Amiga and use an AmigaDOS shell.

FTP File Transfer Protocol, the standard way of transferring files around the Internet. You can use FTP to connect to remote FTP archives on other machines and copy files to your Amiga.

Gopher Allows you to browse Internet resources using menus. A mostly text-based tool that lets you transparently navigate a route through information servers on the Internet by continuously selecting menu items.

Mosaic A browser for the World Wide Web hypermedia document system. Imagine AmigaGuide documents with embedded images, audio, and links pointing to pages not just on your local hard disk, but to pages on other machines around the Internet. The most user-friendly and exciting tool for surfing the Internet.

NFS Sun Microsystems' Network File System. I never get tired of this: it lets you mount remote disks on your local system.

Picture it: you hear about a new file in the Aminet archives, and you want a copy. You know that Washington University in St. Louis keeps a copy of the archives and their Internet address is `wuarchive.wustl.edu`. So, you type:

```
mount wuarchive.wustl.edu:/aminet My_Aminet:
```

and hey presto, an icon called My_Aminet appears on your Workbench. A hard disk thousands of miles away is now virtually connected to your Amiga. Just double-click, and drag-and-drop to take a copy of the file you want.

Of course, you can now have Email and Usenet news sent directly to and from your Amiga. Implementations of protocols like SMTP (Simple Mail Transfer Protocol) and POP (Post Office Protocol) are available. Other systems like *Whois*, *Talk*, *IRC*, *WAIS*, *Veronica*, and so on, are all either available or accessible indirectly through the applications listed above.

The Layered Approach

The most common place to find IP running is over a Local Area Network, usually Token Ring or Ethernet. However, since you can't really run an ethernet cable from your IP provider to your Amiga at home, you'll have to make do with a modem, i.e. serial communications.

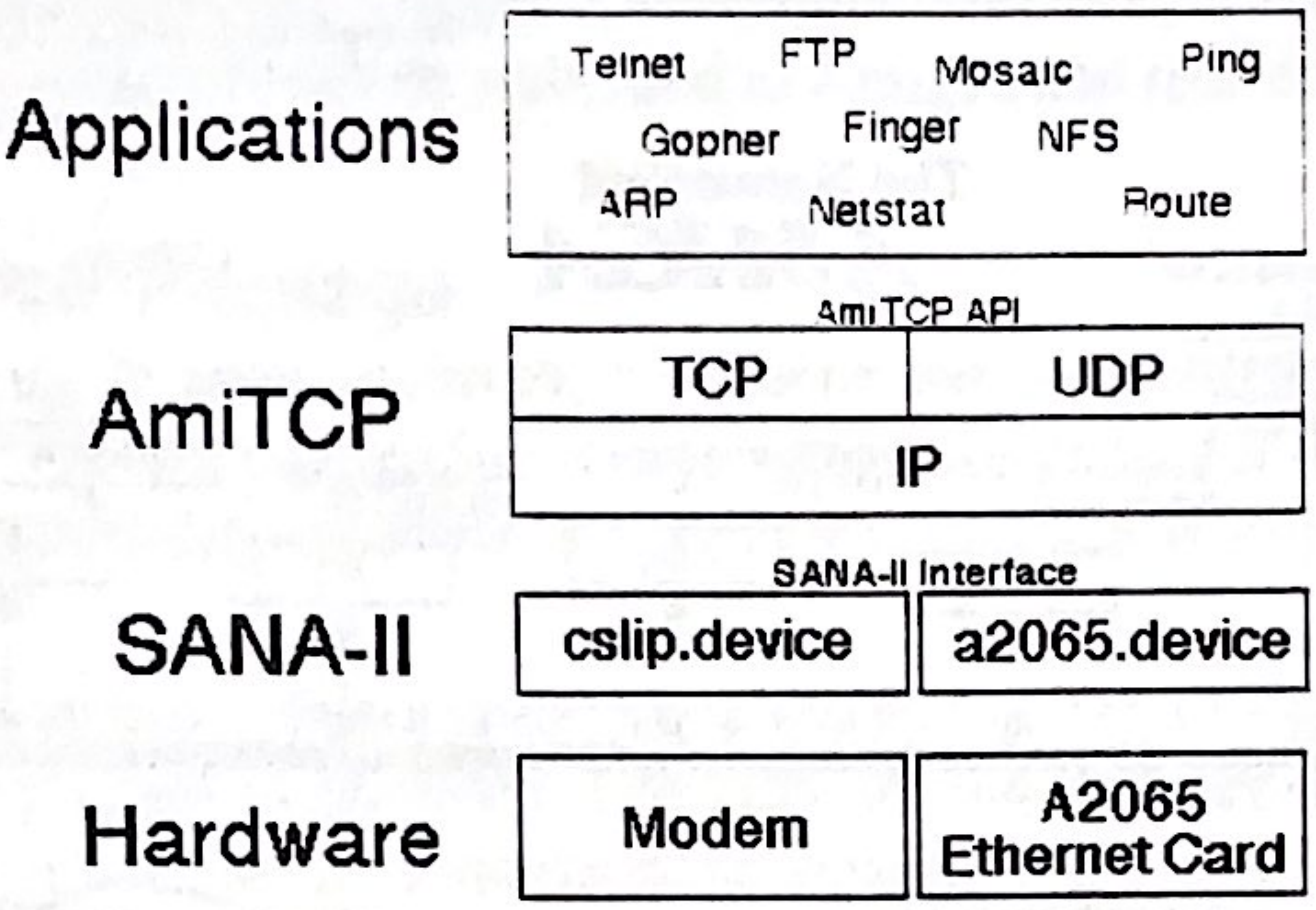


Figure 1. These are the components you'll need for live Internet access.

To run IP over serial lines, you need SLIP (Serial Line Internet Protocol) or CSLIP (Compressed[1] SLIP). More recently, the smarter PPP (Point-to-Point Protocol) has become popular. All of these are available for AmiTCP in the form of SANA-II drivers.

SANA-II is the most recent version of the network device driver specification written by Commodore which provides an Amiga software interface between networking hardware and network protocol stacks such as AmiTCP. What it means for you is that AmiTCP can run IP over any type of network for which there exists a SANA-II driver. A quick look inside my `Devs:Networks` directory shows drivers for Ethernet, Token Ring, Hydra, SLIP, CSLIP and PPP.

This layering is illustrated in Figure 1. Applications are built using AmiTCP's API (Application Programmer Interface) and don't care what goes on under the surface. Similarly, AmiTCP doesn't care what kind of hardware it's using, it just talks to the SANA-II interface of the device you specify. The SANA-II drivers talk directly to the hardware they control.

Now, in an attempt to help you understand the kind of information you need before you set up AmiTCP and indeed to just give you an overall picture of what we're talking about, let's look at a not-so-contrived example of a network.

A Hypothetical Network

Let's say the setup shown in Figure 2 belongs to an Irish group called CUGI. Their domain name is `cugi.ie` and they have a Class C Internet (or IP) address of 192.103.112.0 assigned to their network. The Class C designation means that the 192.103.112 part of their Internet address is fixed, but they are free to use the

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[1] CSLIP only compresses the IP headers, not the data itself.

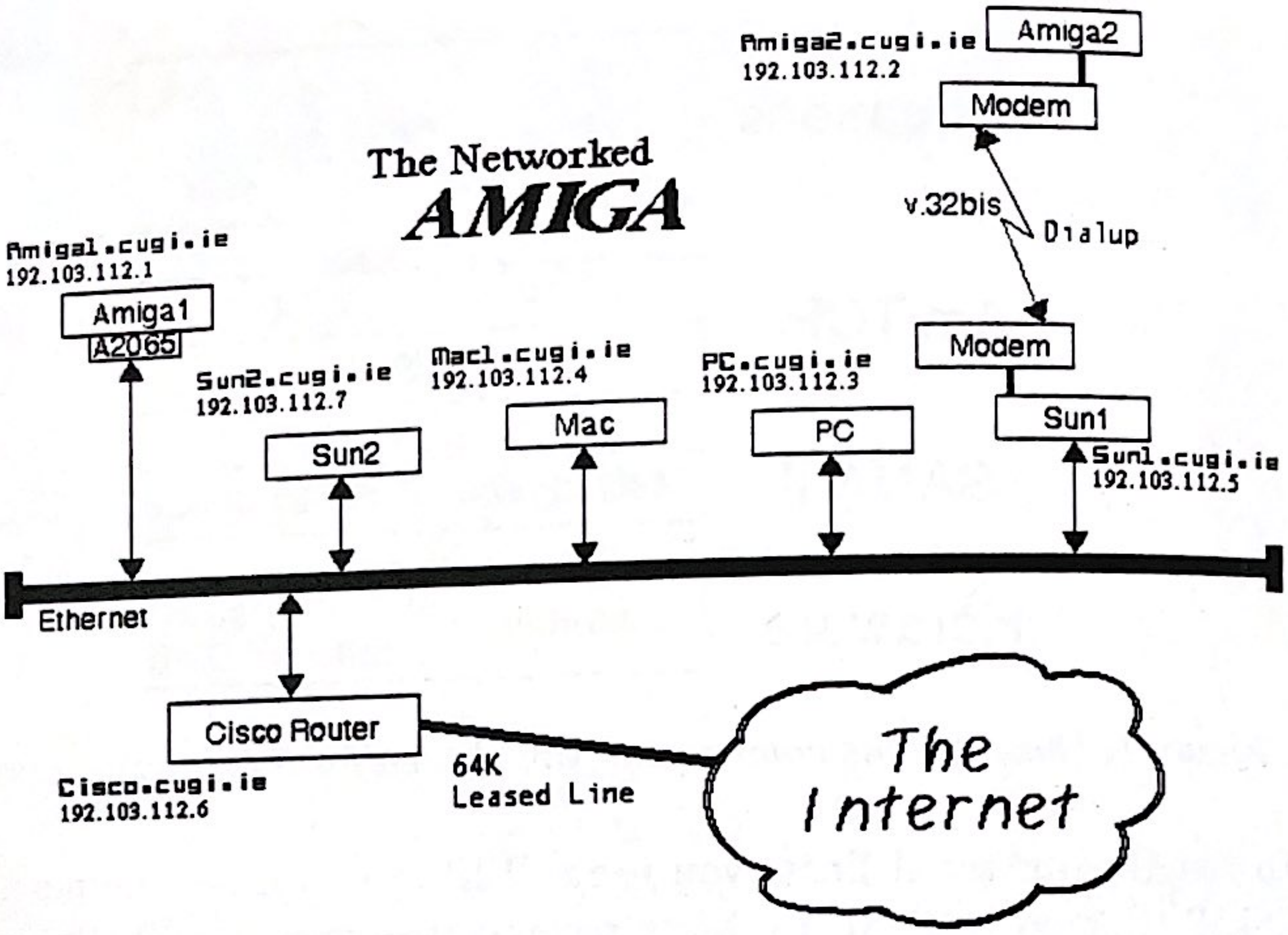

Figure 2. The big picture: how your machine connects to the Internet.

final part to assign numbers to machines on their network (up to 255 machines). Every machine on the Internet has a unique address.[2]

CUGI's network consists of several PCs, Macs, Suns, and of course, Amigas. One Amiga is directly connected to the ethernet using a CBM A2065 card, and the other is remotely connected via modem. The network is connected to the Internet via a Cisco Router which routes IP packets arriving from the outside world to the correct machine on the local ethernet, and vice versa. The router is known as the Internet gateway.

To convert between Internet names such as `pc.cugi.ie` and IP addresses such as 192.103.112.3, one of the Suns (Sun2) is running a nameserver which other machines can query.

The remote Amiga is running AmiTCP using the SANA-II *cslip.device*. The CSLIP destination address for AmiTCP's configuration is 192.103.112.5. Sun1, which has a modem attached, is running a public domain version of CSLIP. There is an account on Sun1 called 'csliplogin' which instead of running a shell for a user, runs CSLIP. AmiTCP on Amiga2 has an ARexx script which dials Sun1 and logs into this account before starting AmiTCP.

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[2] Subsequent to writing this article, it occured to me that I should check if the random IP number I created was actually in use by someone. It turns out that network 192.103.112.0 is assigned to the 'City of Turku' in Finland. My apologies to anyone there for any confusion I may have caused!

A program called ARP (Address Resolution Protocol) is run on Sun1 which intercepts any ethernet packets addressed to Amiga2 and redirects them down the serial line.

The AmiTCP Package

AmiTCP comes in three archives, containing the binaries, documentation and source code. The documentation is quite extensive and a full description of the AmiTCP programming interface is given (essentially, a BSD Socket emulation library).

The binary archive contains everything you need to install AmiTCP. A standard CBM Installer script is provided, and after several releases of the software is now pretty good. It can be quite daunting though, if you're not certain what you want. Default domains, gateways and nameservers may not mean too much to the neophyte. You'll probably find yourself installing the package several times over as you figure out exactly what you're doing. The install script creates all the necessary config files for AmiTCP, and once you understand the structure of these files, you won't need to go near the install script again.

The basic Telnet, FTP and Finger applications are included with AmiTCP, as well as numerous other tools such as netstat, route, ping, and arp to help you configure and troubleshoot your IP link.

Accompanying these standard networking utilities from the Unix world is an Amiga specific application called NetFS. This is similar to Sun's NFS system mentioned earlier, except it's custom built for Amigas. It won't interwork with machines running NFS.

Alternatives to AmiTCP

Only one other TCP/IP implementation is available for the Amiga—Commodore's AS225 networking software. Only version 1.0 is available; version 2.0, although finished and in use by developers, was never shipped.

Version 1.0 is apparently a reasonably complete IP implementation with regular tools such as Telnet, FTP, etc. It also has client NFS, i.e. you can mount remote disks, but you can't allow remote machines to mount your disks. Version 2.0 is said to be much more complete with many bug fixes and server NFS support.

The disadvantage of buying AS225 at this stage is that AmiTCP is becoming the most popular way to write TCP/IP applications for the Amiga. Since AmiTCP uses a different API to AS225, additional work is involved in supporting both systems. Some programs such as *AMosaic* do support both, but many tools are being written exclusively for use with AmiTCP.

I should also mention AmigaNOS. This was developed in the Amateur Radio world by Phil Karn (callsign KA9Q) and has been ported to many platforms. Its original task was to run an X.25 variant and TCP/IP over packet radio: however it has since been used to connect computers using ethernet and serial lines. I haven't discussed it here as it isn't really a full implementation of the TCP/IP stack—it doesn't use any standard programming interface, and cannot support applications like NFS or the X Windows System.

Conclusion

Some of the software I've mentioned may still be in beta-testing when you read this article, but it really is out there. AmiTCP itself is currently at version 2.3, and 3.0 is expected soon.

One problem with AmiTCP is installation. Getting it up and running isn't quite a black art, but having SnoopDOS handy does help. Hopefully version 3.0 will be a little easier to install but unfortunately, without having an understanding of how IP works, troubleshooting software like this is always going to be difficult.

If you're looking for IP for your Amiga, or have a few machines you'd like to network together, AmiTCP could be for you. While it might cause a few headaches, it's good fun to set up, and you'll probably learn a thing or two about networking in the process.

The Retina Graphics Board

by Colin Dalton

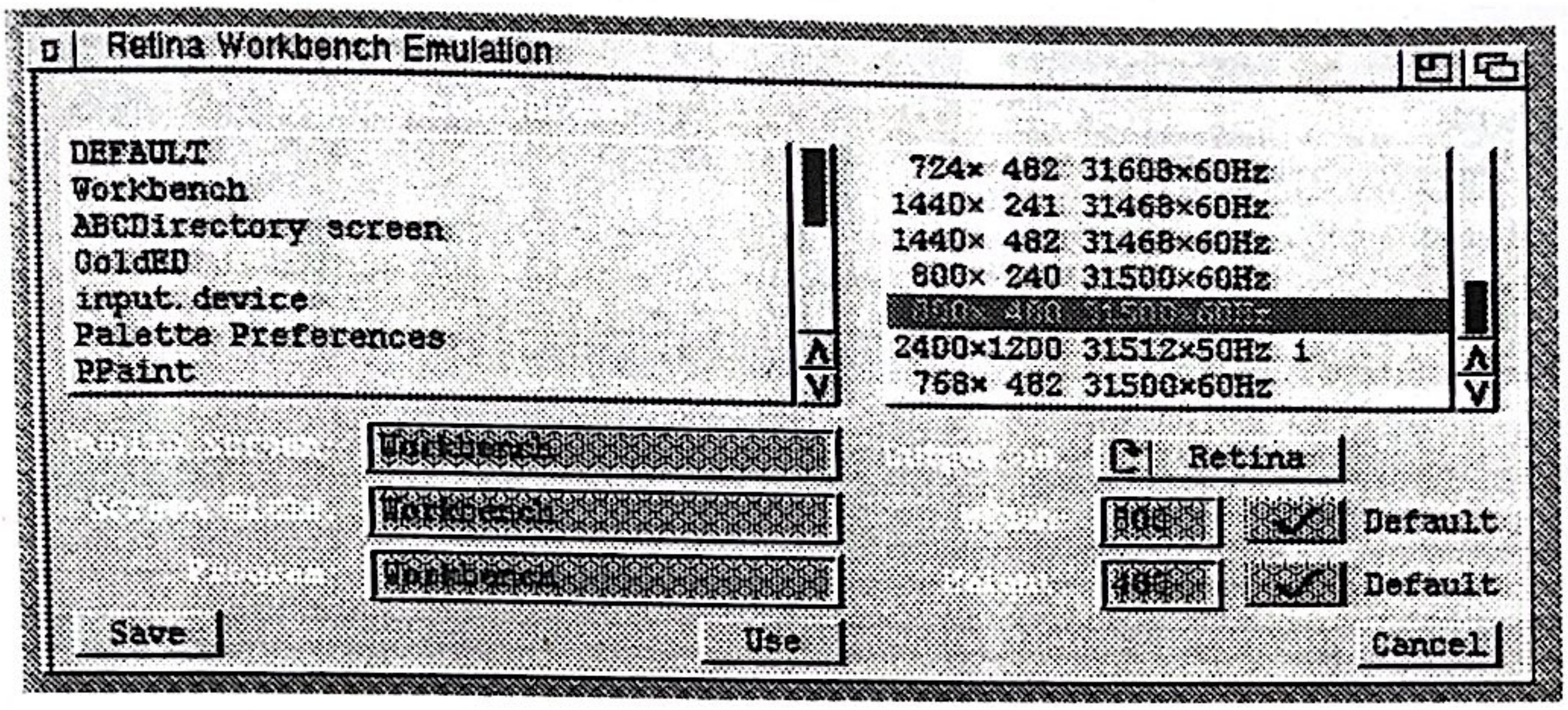
Flicking through various magazines, I couldn't help but be a little jealous of all those reviewers getting to play with the latest generation of high resolution graphics boards. Picasso, Piccolo, Retina... the list goes on. With all the DTP stuff I do, I could sure use one of those, I thought.

Then when Eddy and Geoff got their Picassos, and I was able to see a 1024 × 768 Workbench "in the flesh", my jealousy grew. Well, no sense in dreaming, I thought, I'll never be able to afford one of those. Back to the TV on the 1200.

However, as luck would have it, I got the chance to try out an accelerated A2000 equipped with a Retina (thanks, Jordan!). So, how does it compare with the competition?

First Impressions

Wow! That's all I could think of, as windows flashed around the huge Workbench at an incredible speed. However, as I dug deeper, the limitations of the Retina were soon apparent.



DEFAULT
Workbench
ABCDirectory screen
GoldED
input.device
Palette Preferences
PPaint

```
 724× 482 31608×60Hz
1440× 241 31468×60Hz
1440× 482 31468×60Hz
 800× 240 31500×60Hz
2400×1200 31512×50Hz i
 768× 482 31500×60Hz
```

Workbench
Workbench
Workbench
800
480

A variety of screen modes are supported by the Retina.

The first disappointment was the way Retina emulates Intuition, and how it makes the extra screen modes available. The Picasso adds a set of monitor definitions to the display database, allowing all database-aware programs to select, say, a Picasso:800×600 screen mode. With the Retina, no monitors are added to the display database. You specify the screen mode and size of each screen using the *RetinaEmu* commodity.

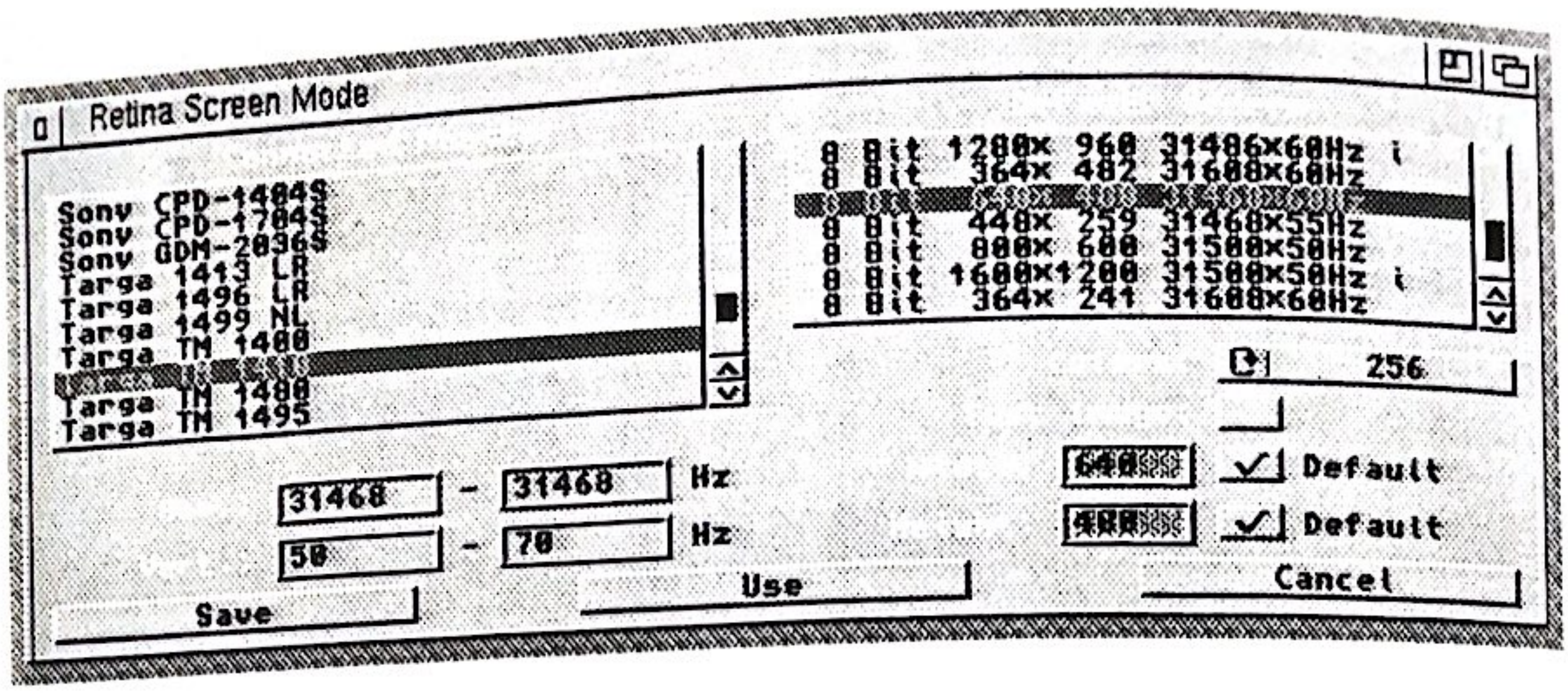
For those programs that do let you use a screenmode requester, you have to select a mode like PAL:High-res Laced, and type the size you want to use into the width and height gadgets, making sure the Autoscroll feature is selected. To get a big Workbench, you type the size you selected in RetinaEmu into the height and width gadgets in the standard ScreenMode program. As far as Intuition is concerned, your big Workbench is just one big autoscrolling screen.

Where Did All My CHIP RAM Go?

While the Picasso uses its own video RAM and normal fast RAM to store screens, the Retina uses CHIP RAM as well as its own onboard RAM. This is a big problem on a 1 Mb CHIP machine, as a 16 colour 1152 × 820 screen with a nice backdrop pattern leaves less that 400 Kb of CHIP RAM free. Because of this, I have had to settle for an 8 colour screen, with no backdrop picture in my windows. The sacrifices I make...

Speed Demon

One thing I did notice about the Retina was how much faster it is than the Picasso, especially in a 68030 system like an accelerated A2000. Waiting for the screen to redraw on Geoff's system (with a 40 MHz '030) is quite a drag; not so on this 25 MHz A2500. The Retina uses NCR's graphic chip, unlike most of the other Amiga graphics boards which use a Cirrus Logic chip containing an onboard blitter. The forthcoming Retina with blitter should be even faster!



Sony CPD-1404S
Sony CPD-1704S
Sony GDM-2036S
Targa 1413 LR
Targa 1496 LR
Targa 1499 NL
Targa TM 1400
Targa TM 1400
Targa TM 1495

8 Bit 1280x 960 31486x60Hz i
8 Bit 364x 482 31600x60Hz
8 Bit 448x 259 31468x55Hz
8 Bit 800x 600 31500x50Hz
8 Bit 1600x1200 31500x50Hz i
8 Bit 364x 241 31600x60Hz

256

31468 - 31468 Hz
50 - 70 Hz

640 ✓ Default
480 ✓ Default

One of the Retina's strongest points is its extensive monitor support.

Colour Depths

With the new release of the Retina software, it is now possible to select screens of up to 256 colours (if you have an AGA Amiga). However, in these modes, the screen update is very sluggish. You can also select a 16 or 24 bit Workbench, but only software that is Retina-aware (such as the bundled *RetinaDisplay* picture viewer) can make use of the extra colours. As far as the rest of the system is concerned, it's just a normal four colour screen.

That means no 24 bit backdrops. However, a 24 bit JPEG in a window on your Workbench screen does look quite impressive, even if you can't grab the screen to show off to your friends.

This is something MacroSystems have to work on—a better system for Intuition emulation, more along the lines of the Picasso.

More Numbers

The NCR chip has a maximum bandwidth of about 90 MHz in 8 bit (256 colour) modes, and 30 MHz in 24 bit modes. This limits these modes to 832 × 624 at 50 Hz refresh, no matter how much onboard RAM you have (the review card had 4 Mb). Your standard 16 colour Workbench can be as high as 1280 × 1024 at a 52 Hz refresh rate (non-interlaced). Even though this is slightly better than the standard PAL frequency, it seems very flickery after a 70 Hz screen!

One of the strengths of the Retina is the ability to define your own screen modes, so the maximum values I outlined above are purely arbitrary—you can enter whatever resolution and refresh rate you want, as long as the values are within the range of your monitor and the pixel clock of the Retina.

Monitor Magic

In the end, a graphics card is only as good as the monitor that you are using. I have tested the Retina with a number of monitors, and it performed flawlessly on all. That said, anything less than an SVGA monitor is wasting the card. On a cheap VGA monitor (31.5 kHz), you can display up to 800 × 600 (but only at a nasty

50 Hz refresh rate); better ones will support 60 Hz.

The monitor I am using is an excellent Samsung SyncMaster 15GL. This has a 15″ FST tube, and digital memory sizing, with controls for vertical and horizontal sizing and positioning, as well as pincushioning. Even at 1280 × 1024, the text is clear and sharp, but a bit too small for a 15″ tube.

Another problem with the Retina is the lack of a pass-through. This means that if you want to play a game or some other program that refuses to be promoted to a Retina screenmode, you have to swap video ports. This isn't too bad, as I don't play games that often, but it might annoy some people.

Compatability

This has been excellent. The Picasso has problems with BOBs, which affects programs such as *Final Copy [Not any more!—Ed]* and some games—the Retina just takes these in its stride. For particularly recalcitrant programs, *RetinaEmu* gives you the option to continuously (or every few seconds) copy the screen data from CHIP memory to the Retina's memory. This fixes *Personal Paint 2.1*, which was given away on a coverdisk recently. Also, if at any time, you hit Ctrl-F7, the screen is refreshed automatically. This is handy for programs like *SysInfo*, which only needs to be refreshed once after it is loaded.

Of little interest to most people (but of great interest to a few) is the fact that there is a Retina-compatible X Window[1] server for *NetBSD*, the freely-distributable Unix for the Amiga. The Retina is the only graphics card supported by BSD at the moment, and allows full colour X sessions.

Another little bonus with the Retina is that is is allegedly able to run programs designed for the Harlequin graphics board. This is an expensive, broadcast quality framebuffer with some excellent software. I was, unfortunately, unable to test these claims.

The Competition

Of the other RTG graphics boards available, I have only briefly looked at the Picasso and the Piccolo. The Picasso did have rather slow Intuition emulation software, but this has recently been fixed. It is a Zorro II card, so it will work in 2000s as well as 3000s and 4000s. The Picasso's strongest point is the no-nonsense way in which it interfaces with Intuition, which makes it very easy to get going.

The Piccolo board is an autosensing Zorro II/III board, and I saw it running in an A3000T equipped with a 35 MHz 68040 with 25 Mb of RAM. This was really very impressive—1024 × 768 in 256 colours was about the same speed as an AGA

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[1] The X Window system is a set of protocols allowing graphical programs to be run over networks, like a GUI terminal emulator. The window managers that sit on top of X provide the GUI.

DBLPAL 640 × 512 screen in 8 colours. The Piccolo uses the EGS Workbench emulation system, as used by a number of other graphics boards. This lets you add display modes in a similar manner to the Picasso.

Also supplied with the Piccolo is the EGS window system, which (unlike Intuition) supports 16 and 24 bit colour screens. A 16 bit picture can be dragged around an EGS screen in real time (i.e. the whole window is updated, not just an outline) at a very impressive speed.

Conclusion

I am very impressed by this card, but a few things let it down. The one major gripe I have is the very unintuitive way in which screen modes are selected—they should simply be added to the monitor display database, where they would then be automatically available to all well-written software.

That said, the Retina provides dozens of extra screenmodes (including bizzare ones like 1900 × 1426 at 53 Hz interlaced), as well as the ability to define your own. The speed of the card was also very welcome—this almost makes up for the rest of the little quirks.

The documentation, a rather sketchy translation from German, was not the best. MacroSystems really have to do better on this—I found myself resorting to Usenet to get answers to rather basic questions that should have been in the manual. That said, once you get used to the Retina's way of doing things, it is fairly straightforward.

If you are looking for a general graphics card to increase the size and depth of your Workbench, I would say look elsewhere: at a Picasso, or a Piccolo if you have a Zorro III system. While the Retina is an excellent card, the software lets it down. Now, if they brought out a Retina with the EGS system, that *would* be good…

Classified Ads

Amiga 500 system: 1 Mb + 3 Mb external unit, external floppy, joystick, new mouse, software, etc. £300 the lot, or will consider selling as separate parts. Ring Dave at 041-38394.

If you have items you want to advertise, please submit them to the editor by the date given on the contents page.

Computers and Chess

by Niall Murphy

Humans seem to have this strange fascination with getting machines to play them at their own game. Ever since the late 18th century, when the chess playing automaton 'The Turk' was first constructed, we seem to have been both repelled and attracted by the notion of computers that could seemingly think.

Perhaps fortunately, computers are *not* yet capable of the general purpose consciousness we would call intelligence, however fearsome at calculation they may be. Recently though, staggering advances have been made in the world of computer programs, available on all of the machines that we know and love, designed both to play the game and to aid your own playing strength. In this article, I will discuss how computer chess programs operate and what the problems with their methods are. I'll also review some of the current applications of these strategies on the Amiga.

How Computers Play Chess

When a novice chessplayer sits down at a chessboard to play a game, very often he has a general idea of what the moves are, what things are *definitely* not good to do and what the eventual aim of the game is. But just as a wise man sees not the same tree that a fool sees, a grandmaster observing the same board will not see the same things as the novice; the board to her will appear to be a coruscating network of weak squares, possible infiltration points for pieces, pawn weaknesses and so on. A talented human has a feeling and an intuition for the game that a computer simply cannot have.

How then do we explain the amazing results produced by the latest crop of chess computers, when in a recent tournament they scored as highly as a group of the strongest grandmasters, including John Nunn?

The answer lies in the tactical nature of chess. Consider: when you play, you are continually 'looking ahead' in the game. For example, you might say to yourself, "Well, if I lob off her bishop with my knight, she'll have to take back with the pawn in front of her king, which means I can zap in with my queen later and check her a couple of times and maybe win some pawns." That is, you form a plan based on the result of your analysis and struggle to carry out that plan against the wishes of your opponent.

But a computer doesn't think and a computer doesn't make plans; all it can do is manipulate numbers. Its strategy is to look ahead in the same fashion, building a game tree in memory of *all* possible captures and retakes, as far as its time limit and processing power will allow. It then evaluates each of these positions, allocating it a number according to how well it thinks it is doing in that particular line.

Evaluation is a mix of material considerations (e.g. having a rook more than your opponent) and positional considerations (e.g. having an excellently posted knight in the centre which controls a lot of important squares). A computer then selects which move it should make next by picking which of all its possible moves leads to the most numerically favourable branch of the tree. That's all a computer does; it doesn't think, it doesn't plan, it isn't really creative. Nonetheless, the humming black box that sits on your desk could very probably mate you with one register tied behind its back. So, again, why is this?

As you may appreciate, the material side of the game is the one currently best 'understood' by computers. Tactical moves—those moves which deal with the exchange of pieces and the giving of check—are the computer's forte, and it is extremely unwise to attempt to beat the computer in this area. Some programs are even capable of looking ahead more than 10 moves in a single position, if it contains a lot of tactical threats.

In addition, the fact that computers can search and retrieve moves from a large database of the current 'right' opening moves to play gives them quite an advantage. In my opinion, these unpleasant truths account for the depressing statistic that commercially available chess systems are better than 99.99% of human players, with only the very top grandmasters remaining untouched by the swathe that the metal monsters are carving through the average human chessplayer.

So why haven't they completely crushed us yet? Why do the remaining 0.01% manage to stay undefeated?

Problems

Ah! Well, here we come to a slightly greyer area in chess, the consideration of strategy and the *position* of pieces. If you look back at the previous example, you'll see that while it is very easy to place a number on the value of pieces (based on how many squares they can cover amongst other criteria) it is not quite so easy to do the same for the position of a piece. Also, what criteria should we use to judge the most important squares? Position relative to the king? Proximity to the central squares (a *very* important concept in chess)? The phase of the moon, perhaps?

Human players can evaluate these things quite well, because they have put their pieces in useful positions to *help them achieve a goal*; that is, their material is performing useful strategic functions. (Strategy, as I understand it, is the working together of many moves to create one long-term goal. The goal of a computer, if it has one, is simply to increase its advantage, numerically speaking, not realising that the quality, or strategic worth of the pieces that it is capturing may be worse than the value of the material that it is letting go in return for them.)

Also, in comparatively quiet positions, where there aren't many opportunities for the exchange of pieces, a human grandmaster can use her innate intuition to slowly improve her position, creating threats that lie just beyond the machine's horizon (the range of its game tree) until the monster is slowly pushed off the board. David Levy pioneered this method, amongst many others, of what he termed 'computer-hostile' play. In other words, do nothing—but do it very well.

While this method may not be very effective against human masters, who would be wise to this game, it tends to score well against the silicon brutes. Professor Donald Michie says of Levy, "By going for blocked positions devoid of tactical mobility, he invites his opponent to reveal its threadbare positional sense and lack of long range strategic ideas. Sooner or later, the machine drifts into some position which it is incapable of recognising as strategically doomed."

I could illustrate with many examples, but here is just one, taken from *How to Beat Your Chess Computer* by D. Levy and R. Keene:

After the initial moves

1. **e4** **g6**
2. **Nc3** **Bg7**
3. **d3**

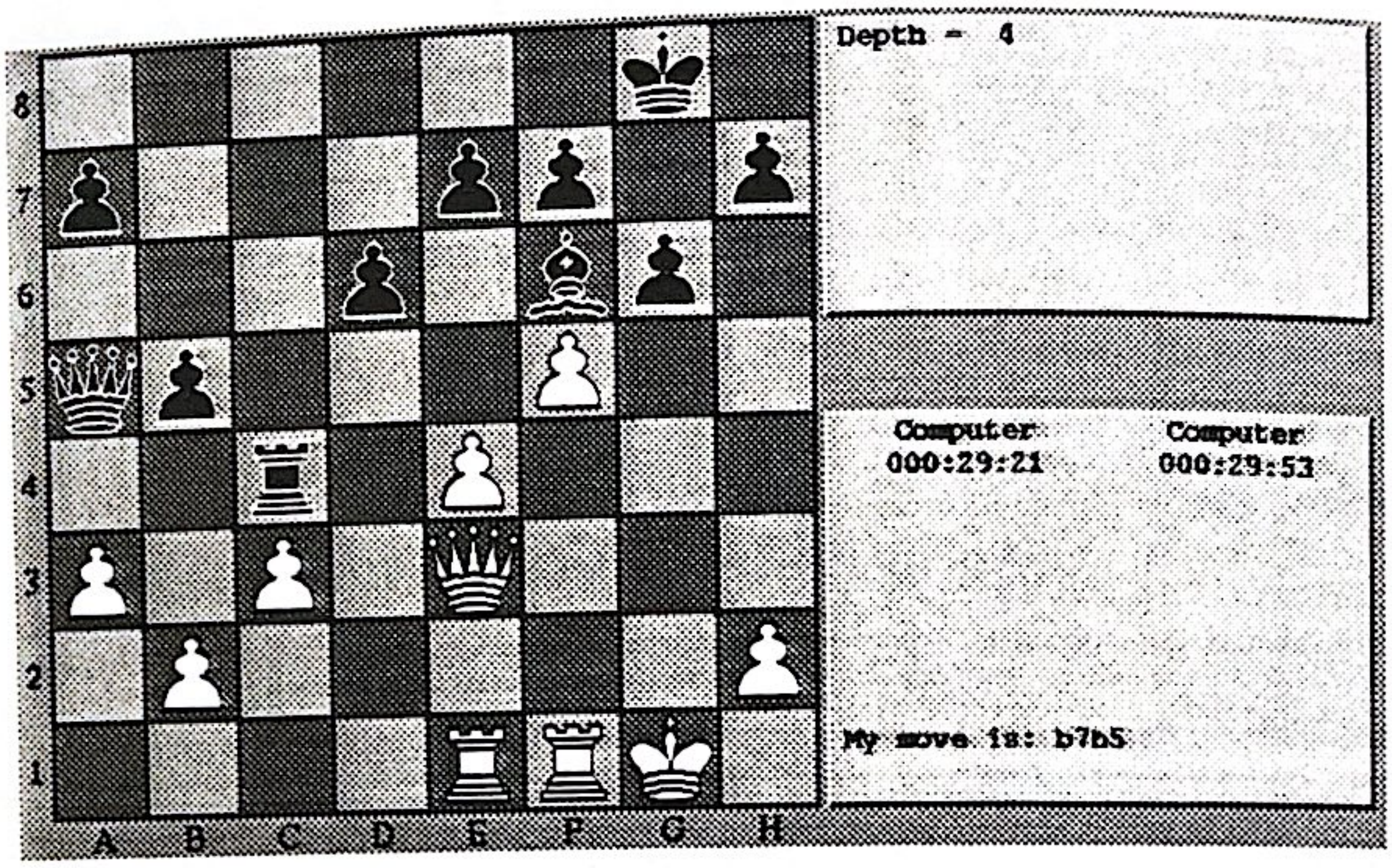
most computers will concentrate on the tactical possibility 3. . .**Bxc3**, most definitely a lemon of a move! Generally speaking, chess programs will have a place in their evaluation function for weaknesses like doubled pawns, etc. Perhaps some of them will recognise that a knight would be slightly less valuable than a bishop in open positions. But very few know that giving up a fianchettoed bishop around the king in this way is a *very* bad idea for black, leaving him with gaping dark square holes around his kingside and depriving him of the bishop-pair.

But, numerically speaking, the disadvantage for doubled pawns is greater than the advantage of having a bishop for a knight, and so the computer merrily plays 3. . .**Bxc3** exclaiming, "Ho ho ho, what a moron this guy is. I can give him doubled isolated pawns! Off with his head!" and rubbing its circuits together with glee at the thought of inflicting a deadly wound on your queenside. Of course, you quietly develop your pieces and then eventually mate it with an attack based around the weak dark squares around its king, **f6**, **g7** and **h6**. See, humans are *not* such a pushover after all!

Programs Available for the Amiga

Unlike the heavyweight packages often costing many hundreds of pounds on the PC, the Amiga has a fair selection of public domain programs, although they are mostly geared towards actually playing the game rather than storing and retrieving or analysing records of games.

All of these programs are available on local bulletin boards, Aminet archive sites, or the Fish Disks. Let's look at a few of them.



Depth = 4

Computer 000:29:21

Computer 000:29:53

My move is: b7b5

GnuChess doesn't need fancy graphics to play a tough game.

Amiga GNU Chess

A product of the Free Software Foundation, *AmigaGnuChess* provides a reasonable GUI on top of close to the best move generating engine now available. Gnu's best features are the edit board function and the wide range of variable time controls, and it plays a reasonable game at the upper levels. Not the most attractive of programs, but then us chess types don't tend to go for surface appearances ;-) Requires Workbench 2.04 or above.

U-Chess

This has a reputation for being a bit of a powerhouse program. It would *prefer* 10 Mb of RAM, a 68040 and a 256 colour screen, but it will make do with 4 Mb and a 68030. Recently, it's been updated to look even more impressive on third-party graphics cards, which I can't test since I haven't got one—I use an Amiga 4000.

Nonetheless, I am puzzled by this program. Apparently it's supposed to be rated at about 2200, but I beat it on my first go; either something was seriously lacking in the memory department or I'm much better than I thought I was. Oh well, those power users out there can use it to show off their machine. Workbench 2.04 or above.

Vector Chess

Nice interface; shame about the playing strength. One to avoid, guys and gals. The notoriously dubious Budapest gambit appears to be its main response to 1. d4. No thank you.

Ami-Board 1.0

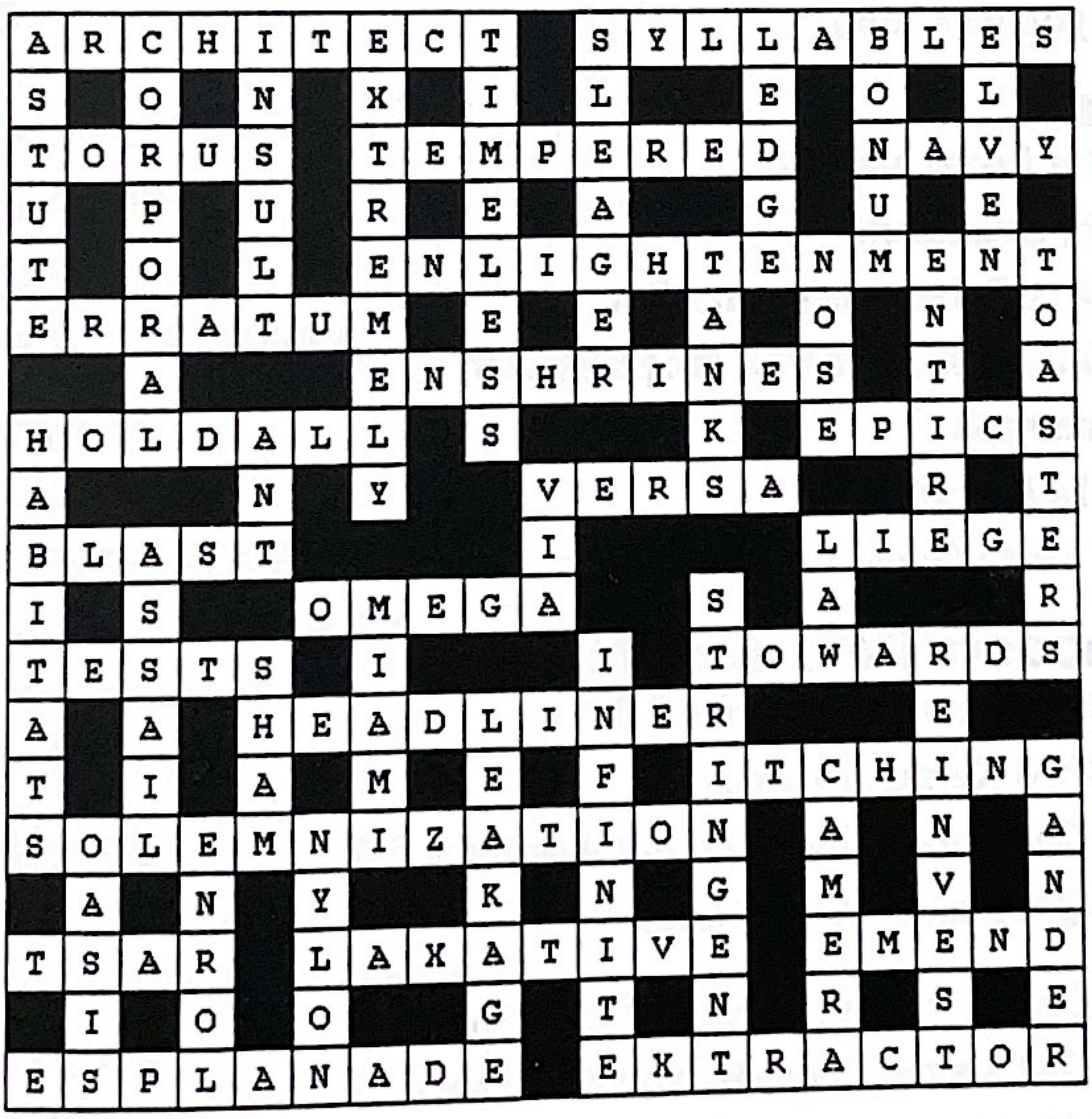
My favourite. Not only is it style guide compliant but it also accepts and stores games recorded using PGN notation, an international standard much beloved of the Internet for posting the results of games. It can also analyse the position of the board for you at any given move—if you register. that enables the computer to think for longer than a minute (although it can play a reasonable game at that time control too.)

With all this and one of the best opening books I've ever seen (theory up to move 20 in the Sicilian Dragon!) this is definitely worth using and supporting.

Farewells

Well, I hope that my information will be of use in the fight against the metal machines—and always remember, while we can plan, they have no advantage against us.

Solution To CUGI Crossword #10



A	R	C	H	I	T	E	C	T	■	S	Y	L	L	A	B	L	E	S
S	■	O	■	N	■	X	■	I	■	L	■	■	E	■	O	■	L	■
T	O	R	U	S	■	T	E	M	P	E	R	E	D	■	N	A	V	Y
U	■	P	■	U	■	R	■	E	■	A	■	■	G	■	U	■	E	■
T	■	O	■	L	■	E	N	L	I	G	H	T	E	N	M	E	N	T
E	R	R	A	T	U	M	■	E	■	E	■	A	■	O	■	N	■	O
■	■	A	■	■	■	E	N	S	H	R	I	N	E	S	■	T	■	A
H	O	L	D	A	L	L	■	S	■	■	■	K	■	E	P	I	C	S
A	■	■	■	N	■	Y	■	■	V	E	R	S	A	■	■	R	■	T
B	L	A	S	T	■	■	■	■	I	■	■	■	■	L	I	E	G	E
I	■	S	■	■	O	M	E	G	A	■	■	S	■	A	■	■	■	R
T	E	S	T	S	■	I	■	■	■	I	■	T	O	W	A	R	D	S
A	■	A	■	H	E	A	D	L	I	N	E	R	■	■	■	E	■	■
T	■	I	■	A	■	M	■	E	■	F	■	I	T	C	H	I	N	G
S	O	L	E	M	N	I	Z	A	T	I	O	N	■	A	■	N	■	A
■	A	■	N	■	Y	■	■	K	■	N	■	G	■	M	■	V	■	N
T	S	A	R	■	L	A	X	A	T	I	V	E	■	E	M	E	N	D
■	I	■	O	■	O	■	■	G	■	T	■	N	■	R	■	S	■	E
E	S	P	L	A	N	A	D	E	■	E	X	T	R	A	C	T	O	R

Solution to Aidan's crossword in the January 1994 Newsletter.

CUGI Library

by Magnus Byne

The CUGI library has a large selection of Amiga books, including a range of Abacus books covering most aspects of the Amiga, and Commodore's Rom Kernel Manuals (essential if you are doing programming). In addition, there are reference books for the C64 and C128, along with general programming and computer books. We also have a good selection of videos covering the Amiga. In addition there are many CD-ROMs which can be borrowed. If you don't have a CD-ROM drive (yet!) the PD software can be copied onto floppies at meetings.

You can borrow books, videos and CDs from the CUGI library at any meeting, provided you have your membership card. They must be returned by the following meeting, but if nobody else wants to borrow them, you can renew them for a further two weeks. As people still persist in not returning books on time we have been forced to impose a fine of 50p on overdue books.

Here's a list of what's currently available (new titles may have been added by the time you read this).

Abacus

AmigaDos Inside and Out
Amiga for Beginners
Amiga Disk Drives Inside and Out
Amiga Guide for Advanced Programmers
Amiga Internals
Amiga Tricks and Tips
Desktop Video Guide

Commodore Reference Manuals

Amiga ROM Kernel, Libraries 2.0
Amiga ROM Kernel, Devices 2.0
Amiga ROM Kernel, Includes and Autodocs 2.0
Amiga ROM Kernel, Style Guide

Amiga ROM Kernel, Libaries and devices 1.3
Amiga ROM Kernel, Includes and AutoDocs 1.3
Amiga ROM Kernel, Hardware Refernce Mannual 1.3

Using the System Software 2.0
AmigaDos Manual 3rd Edition

The C Language

C Quick Reference

New C Primer Plus

The C Programming Language (K&R), 2nd edition

The C Library

Programming in C

General

Amiga Applications

Beginners Guide to the Amiga

Amiga Format Book

The Amiga System

AmigaDos

The Anatomy of the A590

ICPUG Newsletters

Graphics

Amiga Artist

Amiga Vision

Inside Amiga Graphics

Using Deluxe Paint (V2)

Video Toaster User Magazines

Programming

Mapping the Amiga

Amiga Programmers Handbook

MC68881/2 Motorola Data Book

Microcomputer Puzzles

68000 Pocket Book

Golden Oldies

C64 Programmers Reference Guide

C128 Programmers Reference Guide

C64 Service Manual

C128 Service Manual

Advanced C64 Machine Code

The Anatomy of the C64

The Anatomy of the 1541

Videos

History of the Amiga

The Deluxe Paint IV Video Guide

Amiga Animation Video Volume 2

CU Amiga's guide to Amiga Video

Space Wars

Hardware

The CUGI library also has the following hardware available for loan:

- Audio Sampler
- Video Backup System
- Modem (2400 bps)
- Video Digitizer
- Power Scanner

You need to be a member of the club for at least six months before you are entitled to borrow any hardware items. For the Audio Sampler, the Video Backup System and the Modem, there is a rental charge of £2 and a £5 deposit. For the other items, there is a rental charge of £3 and a £7 deposit. For the video digitizer the rental is £3 and the deposit is £10.

The new interface unit and software have arrived for the Scanner, and it can now be borrowed from the library again. However as this is a delicate and expensive item, there is a deposit of £20. Please remember that when you borrow hardware from the club, everyone else in the club relies on you to treat their investment with respect, so please be careful and read the instructions.

For more information contact me at any club meeting.